Synthesis and characterization of Zeolite/Fe3O4 nanocomposite by green quick precipitation method.

ABSTRACT

A green quick precipitation method was successfully used for synthesis of magnetic iron oxide nanoparticles (Fe3O4-NPs) on the surface of sodium/potassium type zeolite. Ferric chloride, ferrous chloride and sodium hydroxide aqueous solutions were used in the synthesis and coating of the Fe3O4-NPs on the surface of the zeolite to produce the zeolite/magnetic iron oxide nanocomposite (zeolite/Fe3O4 –NCs). The reaction was performed in aqueous suspension phase under the ambient condition as green chemistry method. Characterization with Fourier transforms infrared spectroscopy (FT–IR), powder X-ray diffraction (PXRD), scanning electron microscopy (SEM), energy dispersive X-ray fluorescence (EDXF) and transmission electron microscopy (TEM) confirmed the formation of Fe3O4-NPs with mean particle sizes of 3.55±1.02 nm on the surface of the zeolite.

Keyword: Nanocomposites; Zeolite; Iron oxide nanoparticles; X-ray powder diffraction; Transmission electron microscopy; Scanning electron microscopy; Energy dispersive X-ray fluorescence.